

Docket No. F-8329

Ser. No. 10/501,904

REMARKS

Claims 1-3 have been cancelled and new claims 4-9 are pending.

The Examiner has commented on the listing of references in the specification and the IDS provided at the filing of this application because certain of the listed references were not provided to the U.S. Patent Office. Applicant has formally submitted the references to the U.S. Patent Office as required.

The specification has been objected to for referencing figures not included in the specification. Applicant provides herewith a Substitute Specification by which the objections have been obviated. No new matter has been added by the Substitute Specification.

The claims have been objected to and rejected under 35 USC § 112, second paragraph. Applicant has cancelled the claims and provides new claims to overcome the objections and rejections under section 112, second paragraph.

The claims have been rejected under 35 USC § 102(b) as being anticipated by either of Hyo-Moon (USPN 623056) and Chen (USPN 5450248) and the claims have been rejected under 35 USC § 102(e) as being anticipated by Yue (USPN 6357073).

Regarding Yue, the reference teaches an operating plate 18 (identified by the Examiner) that is axially fixed along the shank 11 of the toothbrush 10 and is distally positioned from the bristle segments 12. However, new Claim 4 recites that the operating plate is slidable over a top surface of the leaf spring and includes

Docket No. F-8329

Ser. No. 10/501,904

a fore-end tip which contacts a fore-end bristle segment. Accordingly, Yue fails to teach each limitation of the claimed invention.

Regarding Chen, the reference teaches connecting only the foremost bristle segment to the leaf spring and fixing the remaining bristles within the toothbrush. In comparison, each of the bristle segments in the claimed invention is connected to the leaf spring. Further, the foremost bristle segment in Chen is only capable of moving upwardly and downwardly relative to the toothbrush based on motion of the leaf spring. In comparison, the fore-end bristle segment of the claimed invention capable of pivoting relative to the toothbrush. Accordingly, Chen also fails to teach each limitation of the claimed invention.

Regarding Hyo-Moon, the foremost bristle segment provides a rearwardly facing top surface that is oriented at 90 degrees to the surface on which the operation plate slides. Accordingly, the foremost bristle segment in Hyo-Moon is incapable of pivoting relative to the toothbrush. In comparison, the fore-end bristle segment of the claimed invention has a rearwardly facing and upwardly slanting surface which enables pivoting of the fore-end bristle segment relative to the toothbrush. Accordingly, Hyo-Moon also fails to teach each limitation of the claimed invention.

As none of Hyo-Moon, Chen or Yue teach each claimed limitation, the claims are patentable thereover. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051 (Fed. Cir. 1987) ("a claim is anticipated only if each and every element as set forth in the claim" is found in the cited prior art reference).

Docket No. F-8329

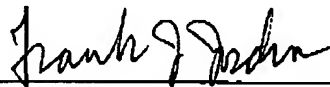
Ser. No. 10/501,904

Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USP2d 1913, 1920 (Fed. Cir. 1989) (an anticipating reference must show "the identical invention...in as complete detail as is contained in the claim").

The USPTO is hereby authorized to charge any fee(s) or fee(s) deficiency or credit any excess payment to Deposit Account No. 10-1250.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,
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SECOND MARKED SPECIFICATION

F-8329

member in the middle, it also has the problem with generation of displeasure caused by bumping noises between teeth and above rugged member when brushing teeth as other conventional toothbrushes brushing those teeth having the grip as much close to the mouth as possible to make the brush head parallel to the teeth array.

BRIEF SUMMARY OF THE INVENTION

The invention relates to the wholesome toothbrush where the brush part can be spread out by partial improvement on the brush structure previously patented with Korea Utility Model Patent No. 2000-8396 by present inventor in order to facilitate brush washing and drying by spreading plies out after using the tooth brush in the ply status of shrunken and concentrated. In accordance with the invention, this wholesome toothbrush is featured providing the brush piece mounted on front-end of the brush part with protruded part slanted upward on the top surface and the first and second mounting grooves formed systematically for having the mounting protrusion snapped therein on inner front wall of the guide sphere.

BRIEF DESCRIPTION OF DRAWINGS

Accompanying the specification are figures which assist in illustrating the embodiments of the invention, in which:

SECOND MARKED SPECIFICATION

F-8329

FIG. 1 is an entire perspective view of the present invention with partial fragmentary views[.];

FIG. 2 is an enlarged perspective view of the brush part of the present invention[.];

5 FIG. 3 is a sectional view of the brush part of the present invention shown as linear[.];

FIG. 4 is a sectional view of the brush part of the present invention shown curved to the direction of curved leaf spring[.];

10 FIG. 5 is a sectional view of the brush part of the present invention shown fully curved to the opposite direction of curved leaf spring[.];

FIG. 6 is a sectional view of the brush part of the present invention shown supported by the operating plate[.];

FIG. 7 is a sectional view of the ruling protrusion of the push-out button shown inserted to the ruling groove[.]; and

15 FIG. 8 is a sectional view of the ruling protrusion of the push-out button shown disassembled from the ruling groove.

DETAILED DESCRIPTION OF THE INVENTION PREFERREDEMBODIMENTS

20 With further references to the drawings the present invention is described as follows.

SECOND MARKED SPECIFICATION

F-8329

As shown on Fig. 1 of entire perspective view of the invention with partial fragmentary views, the present invention is of the construction composed of the flexible groove 12 to enable insertion of protruded guide 4 into the middle of ruling protrusions 6, 6', the ribs 11, 11' covering a grouping of bristle segments

5 100, i.e., a main body of brush part 100 when a plurality of bristle segments 2', 2", i.e., brush pieces 2', 2" are spread out on both side's surfaces of an operating plate 300 of an actuating member, a cavity including the primary and secondary ruling grooves 10, 10' in step where the guide protrusion 6, i.e., the ruling protrusion 6 is engaged in front of inner wall of protruded guide 4 enable angle adjustment to

10 inner direction by having fore-end of operating plate 300 push slanted protrusion 8 of a fore-end bristle segment 9, i.e., a brush piece 9, used for angle adjustment when the ruling protrusions 6, 6' of the operating plate 300 are ruled on the secondary ruling groove 10', the brush piece 9 used for angle adjustment and protruded on top surface of the upward slanted protrusion 8 fixed to front end of

15 the brush part 100, the operating plate 300 connected to connecting bar 8 in order to linearly spread above brush part 100 in correspondence to the movement of push-out button 200 having ruling protrusions 6, 6' protruded to both sides of insert guide 5 inserted to the protruded guide 4 of toothbrush rod 1 and above brush part 100 combined with numbers of brush pieces 2', 2" inlaid to an arcuately

SECOND MARKED SPECIFICATION

F-8329

curved leaf spring 3, planted with ~~bristles~~ brushes 2 therein and fixed to the frond end of the toothbrush rod 1.

In the following drawings the number 13 with out any description herein is the rugged member of the brush part 100, the number 14 is the guide surface of the protruded guide 4 and the number 15 is the third ruling groove of the protruded guide 4.

Such toothbrush invented as described above is improved product in the function of comfortable use from previously patented toothbrush coded as Utility Model Patent No. 2000-8396 and the further descriptions of improved parts for their operations are disclosed below to the reference of the following drawings.

The brush part 100 is supported as the state of linear when foregoing ruling protrusions 6, 6' are fixed on the ruling groove 10 by manipulating the push-out button 200 as depicted on Fig. 3 and thereof the fore-end of operating plate 300 is placed on the starting area of the slanting surface on the slanted protrusion 8 of the brush piece 9 used for angle adjustment.

Therefore when brushing tooth with the toothbrush constructed with above featured technique, it can be comfortably used without any deformation of the brush part 100 that may be generated from free-moving of the push-out button 200 as its' traverse range is located on top of the toothbrush rod 1 being isolated from the grip.

SECOND MARKED SPECIFICATION

F-8329

Also the present invented toothbrush can be used without having any discomfort noise from bumping between tooth and rugged member as ribs 11, 11' are mounted on and cover both sides of operating plate 300 which covers main body part of brush part 100 to hide rugged member 13 of brush pieces 2', 2".

5 The present technique enables to adjust the angle of fore-end of brush part 100 to a certain range inward in order to clean the inner side of grinding tooth which is normally uncomfortable to brush. The foregoing angle adjustment is enabled by inward banding of the brush piece 9 in opposite direction to the curve of the leaf spring 3 as depicted on Fig. 4 with its' elastic force having linear
10 tension force directed to slanted surface cooperated with fore-end of the operating plate 300 while push-out button 200 moves incorporating with the top surface of the ruling protrusions 6, 6' corresponded to the inner guide surface 14 as depicted on Fig. 4 when moving the push-out button 200 to the arrowed direction
15 shown on Fig. 7a after isolating ruling protrusions 6, 6' from the ruling groove 10 by pushing the foregoing button 200.

Accordingly when the ruling protrusion 6, 6' of the button 200 reaches to the secondary ruling groove 10' the button 200 is fixed to a certain position in correspondence with fore-inner wall of the guide protrusion 4 cooperated with fore surface of the insert guide 5 when the ruling protrusions 6, 6' are mounted on
20 the secondary ruling groove 10' by counter force of the leaf spring 3.

SECOND MARKED SPECIFICATION

F-8329

And therefore it facilitate the tooth brushing on inner side of grinding tooth by placing the brush piece 9 used for angle adjustment, and slanted inward for a certain degrees, on the inner side of the grinding tooth.

As previously described the present invention with the brush part 100 bent inward for a certain degree or as linear enables maximized cleaning effect. To wash the present toothbrush the brush pieces 2', 2" can be spread out by the curved leaf spring 3 of the brush part 100 when fixing the button 200 with the ruling protrusions 6, 6' hooked to the third ruling groove 15 by corresponding hind surface of the insert guide 5 and rear-inner wall of the guide protrusion 4 by moving the push-out button 200 to the arrowed direction as shown on Fig. 5.

The push-out button 200 of the present invention was designed to facilitate easy assembly utilizing the flexible groove 12 in order to insert guide protrusion 4 into the middle area of the ruling protrusion 6 as depicted on Fig. 7 and once it is assembled the button 200 is free from separation.

In sum, the invention provides a center rod 1 and an arcuately curved leaf spring 3 connected to a fore-end tip of the rod 1 (Fig. 1). The spring 3 extends forwardly and curves upwardly from the tip. A plurality of bristle segments 2, 2', 2" are each disposed on the leaf spring 3. Bristles inlaid in the bristle segments extend from a bottom surface of the spring 3. An actuating member is provided that includes a forwardly disposed operating plate 300. The

SECOND MARKED SPECIFICATION

F-8329

actuating member is slidably disposed on the rod 1 so that: the operating plate 300 is slidable over a top surface of the spring 3 for linearly extending the spring 3 (Fig. 3); and a fore-end tip of the operating plate 300 is slidable against a rearwardly facing and upwardly slanting surface 8 of a fore-end segment 9 of the plurality of bristle segments for pivoting the fore-end segment 9 relative to the rod 1 (Fig. 5).

Furthermore, the actuating member is normally locked against the rod 1. The actuating member includes a rearwardly disposed push button 200 and the push button is pushable for enabling sliding of the actuating member over the rod 1 (Figs. 4 and 5). The push button 200 includes guide protrusions 6, 6' (Figs. 1, 7 and 8) extending from opposing side surfaces of the actuating member. The rod 1 includes a guide cavity 4 formed to receive the guide protrusions 6, 6' (Figs. 7 and 8). The protrusions are normally locked against the cavity (Fig. 7) for preventing sliding of the actuating member over the rod 1. Pushing the button 200 releases the protrusions 6, 6' from the cavity (Fig. 8) for enabling sliding of the actuating member over the rod 1. A flexible groove 12 is formed between the guide protrusions 6, 6' (Fig. 7) in the actuating member.

The operating plate 300 includes opposing side ribs 11, 11' (Fig. 1) extending downwardly from opposing side edges of the operating plate 300. The

SECOND MARKED SPECIFICATION

F-8329

opposing side ribs are capable of enclosing opposing side surfaces of a fore-end segment of the rod when the operating plate is disposed thereover.

INDUSTRIAL APPLICABILITY

As foregoing description of a preferred embodiment of the invention explained, the present invention prevents inconvenience use from displacement of the push-out button as its' traversing part is located on top of the toothbrush rod being isolated from the grip, facilitates to brush the inner side of grinding tooth by having the brush piece used for angle adjustment mounted on fore end of the brush part, prevents bumping noise between tooth and rugged member by having the ribs covering the body of the brush part mounted on both side surfaces of the operating plate and facilitates assembling the functioned part by having flexible groove in the middle part of the ruling protrusion.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not as restrictive. The scope of the invention is, therefore, indicated by the appended claims and their combination in whole or in part rather than by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.

20 **LEGEND**

SECOND MARKED SPECIFICATION

F-8329

~~100: Brush Part~~ ~~200: Push-Out Button~~ ~~300: Operating Plate~~~~1: Toothbrush Rod~~ ~~2,2': Brush Piece~~ ~~3: Leaf Spring~~~~4: Protruded Guide~~ ~~5: Insert Guide~~ ~~6,6': Ruling~~

Protrusion

5 ~~7: Connecting Bar~~ ~~8: Slanted Protrusion~~ ~~9: Brush Piece used for Angle Adjustment~~~~10, 10': Primary, Secondary Ruling Grooves~~ ~~11, 11': Ribs~~ ~~12: Flexible Groove~~~~13: Rugged Member~~ ~~14: Guide Surface~~ ~~15: Third Ruling Groove~~